

Miniature UAV Wind LIDAR & Flight Extension System, Phase I

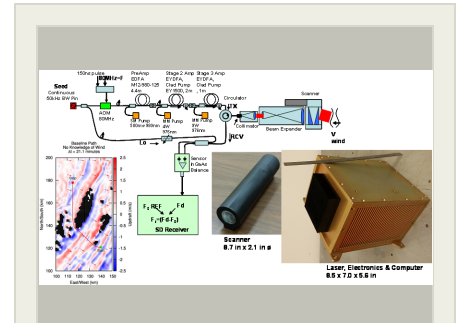
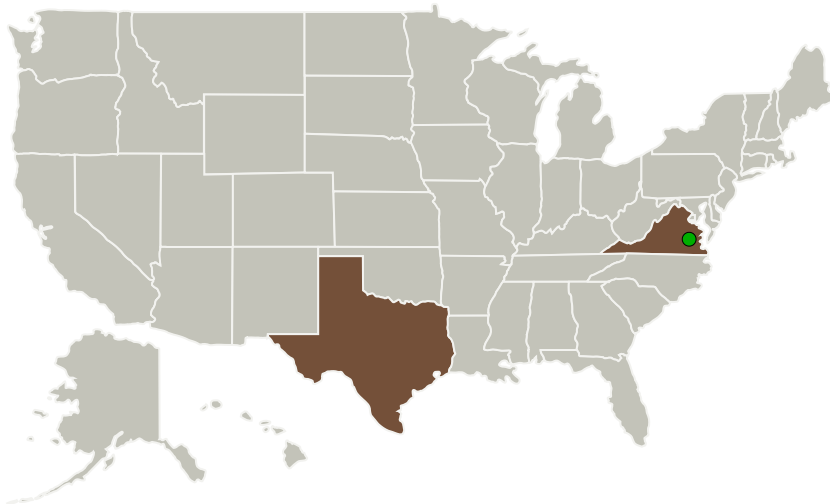
Completed Technology Project (2015 - 2015)



Project Introduction

Systems & Processes Engineering Corporation and Texas A&M University propose a Wind Measurement LIDAR System for extending the flight duration or decreasing fuel consumption on UAVs and light aircraft. The system uses a fiber optic based, eye-safe wind LIDAR from another NASA effort, combined with previous software studies on an Army program to yield a system capable of increasing fuel economy by up to 20% by optimally moving control surfaces in response to thermals and wind gusts, seen by the wind LIDAR. The system also plots the optimum course through thermals and wind gust for maximum dwell time or fuel economy. The sensor assembly is composed of a wind LIDAR using fiber optic transceiver operating at eye-safe 1550nm. This LIDAR allows air current Doppler detection beyond 3km and fine range resolution by using pulse compression. The LIDAR was sized to detect energy sources, vertical uplifts, wind direction, wind gradients and transient gusts, for energy conservation in UAVs

Primary U.S. Work Locations and Key Partners



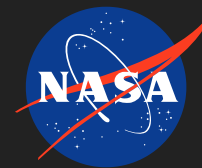
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| Organizations Performing Work | Role | Type | Location |
|---|-------------------------|--|-------------------|
| Systems & Processes Engineering Corporation | Lead Organization | Industry Veteran-Owned Small Business (VOSB) | Austin, Texas |
| ● Langley Research Center(LARC) | Supporting Organization | NASA Center | Hampton, Virginia |

Primary U.S. Work Locations

| | |
|-------|----------|
| Texas | Virginia |
|-------|----------|

Project Transitions

▶ **June 2015:** Project Start

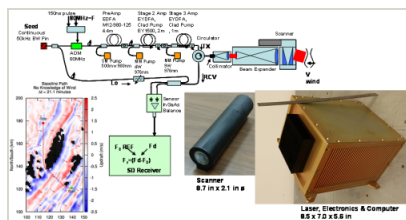
✓ **December 2015:** Closed out

Closeout Summary: Miniature UAV Wind LIDAR & Flight Extension System, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/139234>)

Images

**Briefing Chart Image**

Miniature UAV Wind LIDAR & Flight Extension System, Phase I
(<https://techport.nasa.gov/image/132995>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Systems & Processes Engineering Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

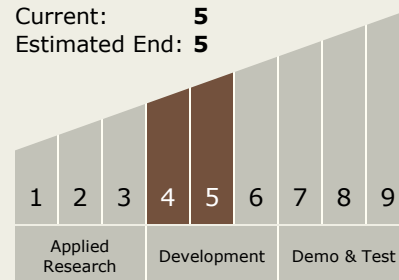
Brad Sallee

Technology Maturity (TRL)

Start: **4**

Current: **5**

Estimated End: **5**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.8 Ground and Flight Test Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System